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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/528,549	03/21/2005	Garry George France	85099	3985
22242	7590	11/18/2005	EXAMINER	
FITCH EVEN TABIN AND FLANNERY 120 SOUTH LA SALLE STREET SUITE 1600 CHICAGO, IL 60603-3406			NATALINI, JEFF WILLIAM	
			ART UNIT	PAPER NUMBER
			2858	

DATE MAILED: 11/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

Office Action Summary	Application No. 10/528,549	Applicant(s) FRANCE, GARRY GEORGE	
	Examiner Jeff Natalini	Art Unit 2858	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-12, 15-26 and 29-32 is/are rejected.
- 7) ☒ Claim(s) 13, 14, 27 and 28 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3/21/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

Claim Objections

1. Claim 13 is objected to because of the following informalities:
 - The second to last line of the claim (pg 34 line 17), there is a number 2 listed after (Attenuation/ Depth of sample), this 2 should square the variable (Attenuation/ Depth of sample).

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 15-19, 21, and 24-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Bell (4788853).

In regard to claim 15, Bell discloses a method/apparatus for measuring an amount of at least one component in a sample comprising (apparatus):

a microwave generator that generates a continuous linearly sweeping microwave signal varying in frequency (col 1 line 34-36, fig 3 (1));

a microwave transmitter for transmitting the generated signal (fig 3 (2,3));

a microwave receiver that receives the transmitted signal (fig 3 (4); col 3 line 15-22);

an analyzer that measures and analyzes generated signal and the received signal and produces an output signal (col 3 line 27-37); the output signal indicating phase or amplitude differences between the generated signal and the received signal (col 3 line 26-50);

means for determining a depth of the sample located between said transmitted and receiver (col 3 line 57 – col 4 line 3);

a processor that determines the amount of the component in the sample from the depth and output signal (col 4 line 20-30; fig 3 (6)).

In regard to claim 16, Bell discloses wherein the linear sweeping microwave signal varies in frequency between a range of .1 GHz to 4.00 GHz (col 4 line 54-56, discloses a frequency in this range).

In regard to claim 17, Bell discloses wherein the linear sweeping microwave signal varies in frequency between a range inclusive of 1.25 GHz to 1.65 GHz (col 2 line 35-37).

In regard to claim 18, Bell discloses wherein transmitting and receiving signals is done through antennas (col 3 line 15-16 and col 4 line 11-15).

In regard to claim 19, Bell discloses wherein phase shift is measured by a microwave mixer that receives a portion of the generated signal and received signal (col 3 line 27-37 and col 1 line 57 – col 2 line 9; attenuation or change between signals would include phase).

In regard to claim 21, Bell discloses wherein attenuation of an amplitude of the generated signal is measured by an amplitude detector (col 4 line 15-24; the processor

calculates the attenuation, and data from an amplitude detector (signal strength) (fig 3 (7)).

In regard to claim 24, Bell discloses measuring a depth of the sample by an ultrasonic means (col 4 line 1).

In regard to claim 25, Bell discloses wherein the processing is performed by a microprocessor (col 3 line 62-65).

In regard to claim 26, Bell discloses wherein the component in the sample is water (col 1 line 8-11).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-7, 9-12, 22-23, and 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bell (4788853) in view of Gould (6560562).

In regard to claims 1, 10, 22, and 23, Bell discloses all that is disclosed above in claim 15, and Bell discloses wherein sampling is done with the processing means as all data collected is run through linear regression program (col 3 line 34-56).

Bell lacks specifically stating wherein random stratified sampling of the received signal is used to measure the phase shift and attenuation of amplitude.

Gould discloses in a microwave moisture meter (col 2 line 53-59) using stratified random sampling to obtain the output signal, so as to take advantage of serial correlation (col 2 line 7-18).

It would have been obvious to one with ordinary skill in the art at the time the invention was made for Bell to incorporate in the processor for determining phase/amplitude using random stratified sampling of the received signal as taught by Gould in order to meet precision objectives in the measuring apparatus (col 2 line 12-14).

In regard to claim 2, Bell discloses wherein means for determining depth of the sample comprises a sample depth analyzer that measures depth of the sample (col 3 line 57 – col 4 line 3).

In regard to claim 3, Bell discloses wherein the depth analyzer is an ultra-sonic transmitting device (col 4 line 1).

In regard to claim 4, Bell discloses wherein the linear sweeping microwave signal varies in frequency between a range of .1 GHz to 4.00 GHz (col 4 line 54-56, discloses a frequency in this range).

In regard to claim 5, Bell discloses wherein the linear sweeping microwave signal varies in frequency between a range inclusive of 1.25 GHz to 1.65 GHz (col 2 line 35-37).

In regard to claim 6, Bell discloses wherein transmitting and receiving signals is done through antennas (col 3 line 15-16 and col 4 line 11-15).

In regard to claim 7, Bell discloses wherein phase shift is measured by a microwave mixer that receives a portion of the generated signal and received signal (col 3 line 27-37 and col 1 line 57 – col 2 line 9; attenuation or change between signals would include phase).

In regard to claim 9, Bell discloses wherein attenuation of an amplitude of the generated signal is measured by an amplitude detector (col 4 line 15-24; the processor calculates the attenuation, and data from an amplitude detector (signal strength) (fig 3 (7)).

In regard to claim 11, Bell discloses wherein the processing is performed by a microprocessor (col 3 line 62-65).

In regard to claim 12, Bell discloses wherein the component in the sample is water (col 1 line 8-11).

In regard to claim 29, Bell discloses wherein the apparatus determines an amount of at least one material in the sample (col 4 line 24-30).

In regard to claim 30, Bell discloses wherein the at least one component modifies the signal (col 4 line 24-30, the signal after going through the component is changed and that changed is determined, abstract).

In regard to claim 31, Bell discloses wherein the at least one component is water (col 1 line 8-11).

In regard to claim 32, Bell discloses wherein the sample is coal (col 1 line 4-7).

Claims 8 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bell (4788853) and Gould (6560562- for claim 8) as applied to claim 7 and 19 above, and further in view of Jakkula et al. (5315258).

Bell discloses wherein the microwave mixer generates an output signal comprising an oscillating voltage with a DC bias and frequency (col 3 line 24-56, constant 1 is the bias and can be seen in figures 1 and 2 that the signal contains a bias as it doesn't start at the origin), where the bias is proportional to the output signal (col 3 line 46-50).

Bell lacks specifically wherein the bias is proportional to a change in velocity of the signal and provides a change in overall dielectric constant of the component in the sample.

Jakkula et al. discloses a microwave moisture device that states that velocity of the microwaves through the material is directly related to the moisture content (abstract) and the velocity of the waves through the material is directly related to the dielectric constant (col 1 line 46-50).

It would have been obvious to one with ordinary skill in the art at the time the invention was made for Bell to incorporate and use in calculating the moisture in a sample the fact that the velocity of the microwaves through the material is directly related to the dielectric constant and moisture constant of the material as taught by Jakkula et al. in order to quickly and continuously measure the moisture in a sample (col 1 line 32-35).

Allowable Subject Matter

Claims 13, 14, 27, and 28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In regard to claims 13 and 27, the equation used for determining moisture content as follows:

Moisture content = $M0 + M1 \cdot (\text{Attenuation} / \text{Depth of sample}) + M2 \cdot (\text{Velocity} / \text{Depth of sample}) + M3 \cdot (\text{Velocity} / \text{Depth of sample})^2 + M4 \cdot (\text{Attenuation} / \text{Depth of sample})^2$; wherein

Attenuation = (amplitude measured with sample) - (amplitude measured without sample);

Velocity = (microwave velocity measurement with sample) - (microwave velocity measurement without sample); and

Depth of sample = (Depth with sample) - (depth without sample);
and

M0, M1, M2, M3 and M4 are calibration coefficients determined by performing a simple linear regression of variables: (Attenuation/Depth of sample), (Velocity/Depth of sample), (Velocity/Depth of sample)² and (Attenuation/Depth of sample)² against experimentally determined values for the component.

in the combination as claimed.

Claims 14 and 28, depend from claims 13 and 27 respectively, and would also be allowable if all objections are overcome.

Conclusion

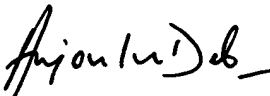
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. De et al. (5132623) discloses antennas to transmit energy through material under test to measure dielectric properties of the material over a range of frequencies. Anjur et al. (Pub # 20020198863), discloses the use and reasons for using stratified random sampling; when the population of the data set is not homogeneous, the population can be divided into homogenous subgroups and a random sample can be taken of each subgroup.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff Natalini whose telephone number is 571-272-2266. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diane Lee can be reached on 571-272-2399. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jeff Natalini



ANJAN DEB
PRIMARY EXAMINER